

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7269 (1974): Number of Aircraft Engines, Engine Cylinders, Combustion Chambers and Direction of Rotation of Engines and Propellers [TED 14: Aircraft and Space Vehicles]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

(Reaffirmed 2005)

NUMBERING OF AIRCRAFT ENGINES, ENGINE CYLINDERS, COMBUSTION CHAMBERS AND DIRECTION OF ROTATION OF ENGINES AND PROPELLERS

1. Scope — Specifies the methods of numbering aircraft engines, engine cylinders and combustion chambers, and the method of describing the direction of rotation of engines and propellers.

2. Numbering of Engines

2.1 Principle — The numbering of engines shall be according to the engine location in the airframe. The numbering order shall correspond to that in which the axis of each engine is encountered by a plane parallel to the plane of symmetry of the aircraft and moving from port to starboard. When this plane simultaneously meets the axes of several engines they shall be numbered from front to rear or from bottom to top, as appropriate. No two engines in a given airframe shall bear the same number.

2.2 Horizontal Thrust Engines (see Fig. 1) — Horizontal thrust engines, including those which have a vertical thrust capability also (that is dual purpose engines) shall be numbered 1, 2, 3, etc, in accordance with the principle in 2.1, the numbers of the dual purpose engines being based on their relative positions in cruising flight.

2.3 Vertical Thrust Engines (see Fig. 2) — Engines having a purely vertical thrust capability shall be numbered, in accordance with the principle in 2.1, in a sequence continuing after that of engines covered by 2.2.

2.4 Take-Off Booster Engines — Take-off booster engines shall be numbered in accordance with the principle in 2.1, in a sequence continuing after that of all other engines covered by 2.2 and 2.3.

3. Numbering of Cylinders in Piston Engines

Note — For the purpose of this clause, the observer is regarded as viewing the engine from the end remote from the propeller, or from the end remote from the shaft transmitting the greatest part of the power of the engine.

3.1 In-Line Piston Engines

3.1.1 Single-bank engine (see Fig. 3A) — The cylinders of an engine having one bank of cylinders in line shall be numbered 1, 2, 3, etc, beginning with the cylinder nearest to the observer.

3.1.2 Double- and multi-bank engines (see Fig. 3B, 3C and 3D) — The rows of cylinders on an engine having two or more banks of cylinders shall be designated by the letters A, B, C, etc, applied respectively to each bank in the order in which its centre line would be encountered by a semi-plane, centred upon the main shaft of the engine and rotating in a clockwise direction, starting from the twelve o'clock position.

Each cylinder shall be designated by a letter followed by a number, the letter indicating the bank, as described above, and the number indicating the position of the cylinder in the bank, when counted from the cylinder nearest to the observer.

3.2 Radial Piston Engines (see Fig. 4)

3.2.1 Single-row and staggered double-row engines (see Fig. 4A and 4B) — The cylinders of single-row and staggered double-row engines shall be numbered 1, 2, 3, etc, in the order in which their centre lines would be encountered by a rotating semi-plane as described in 3.1.2.

3.2.2 Staggered multi-row radial engine (see Fig. 4C) — The rows of cylinders in a staggered multi-row engine shall be designated by the letters A, B, C, etc, beginning with the radial row nearest to the observer.

Each cylinder shall be designated by a letter, followed by a number, the letter indicating the radial row, as described above, and the number indicating the position of the cylinder in the row when counted by the method described in 3.2.1.

3.2.3 Straight double- and multi-row radial engines (see Fig. 4D) — The cylinders of double- and multi-row radial engines with the cylinders in straight lines shall be numbered in the same way as those of multi-bank in-line piston engines (see 3.1.2).

4. Numbering of Components in Turbine Engines

Note — For the purpose of this clause, the observer is regarded as viewing the engine from the end opposite to the component which includes the compressor.

4.1 The combustion chambers, flame tubes, burners or other similar components placed around the engine shall be numbered 1, 2, 3, etc, in the order in which their centre lines would be encountered by a semi-plane; centred upon the main shaft of the engine and rotating in a clockwise direction; as viewed by an observer looking at the turbine in the direction opposite to the general flow of air in the engine, the semi-plane being initially at twelve o'clock position (see Fig. 5).

5. Numbering of Components in Rotorcraft Engines — The components in engines installed in rotorcraft with the axis of the main shaft sensibly vertical, and in engines intended specifically for rotorcraft, shall be numbered in accordance with the requirements of 3 or 4, as appropriate, except that the starting position of the rotating semi-plane shall be as selected by the constructor. In such cases, the cylinders and combustion chambers shall be clearly marked with letters and numbers, visible when the engine is installed.

6. Direction of Rotation of Engines — The direction of rotation of engines shall be described by reference to the direction of rotation of the shaft transmitting the greatest part of the power of the engine. It shall be expressed as clockwise or counter-clockwise, as appropriate, piston engines being viewed from the end remote from the shaft, and turbine engines being viewed in the direction opposite to the general flow of air in the engine.

7. Direction of Rotation of Propellers

7.1 The direction of rotation of a propeller shall be described by reference to its rotation as seen from the end of the engine remote from the propeller. It shall be expressed as:

Clockwise or Counter-clockwise as appropriate.

It follows from this description and that given in 6 that a propeller considered alone has the same direction of rotation as the engine upon which it is mounted.

7.2 The description of a propeller shall be completed by an indication of the direction of its axial force in relation to the engine, that is, tractive or propulsive, as follows:

- a) Clockwise tractor propeller,
- b) Counter-clockwise tractor propeller,
- c) Clockwise pusher propeller, and
- d) Counter-clockwise pusher propeller.

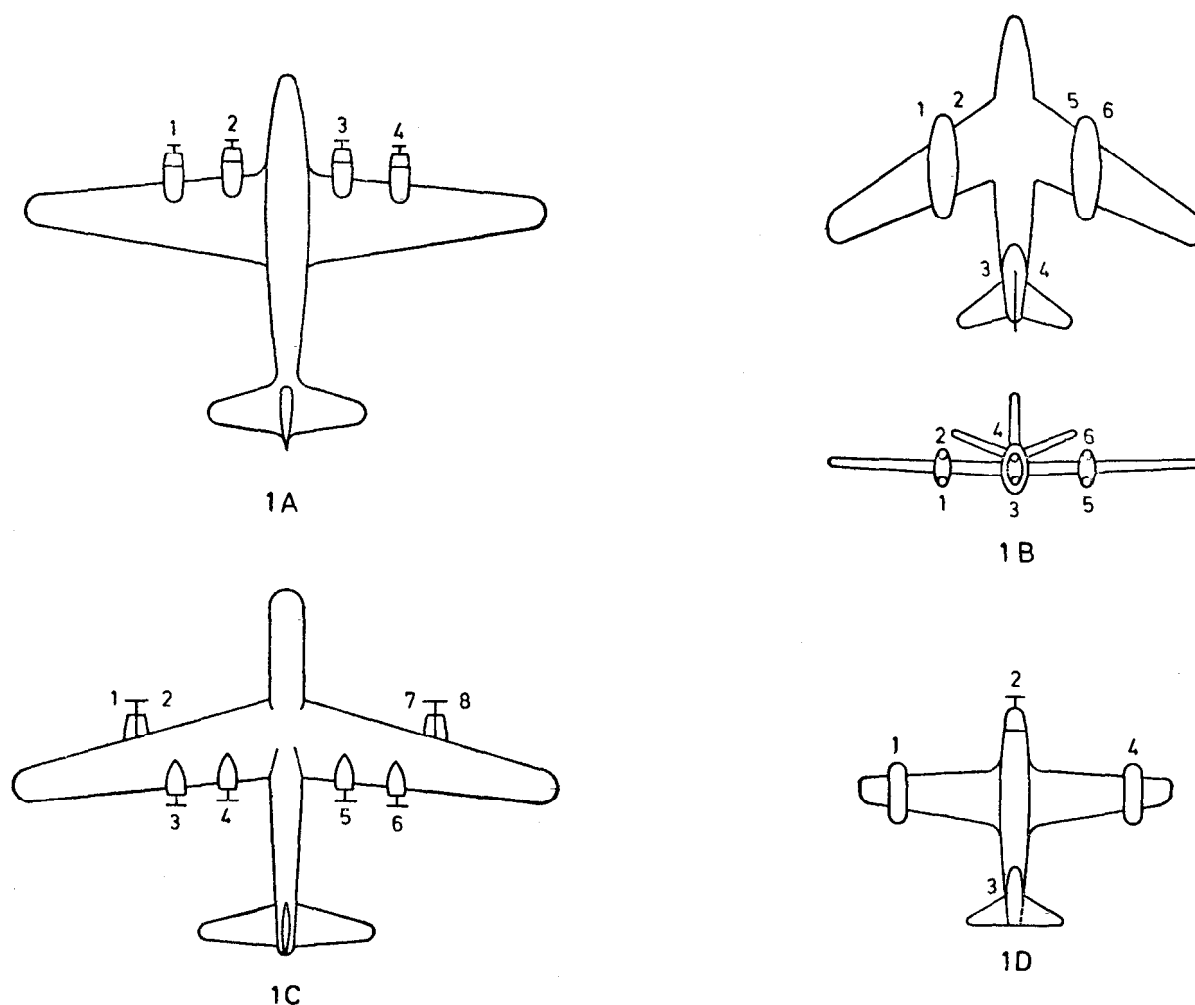


FIG. 1 NUMBERING OF HORIZONTAL THRUST ENGINES

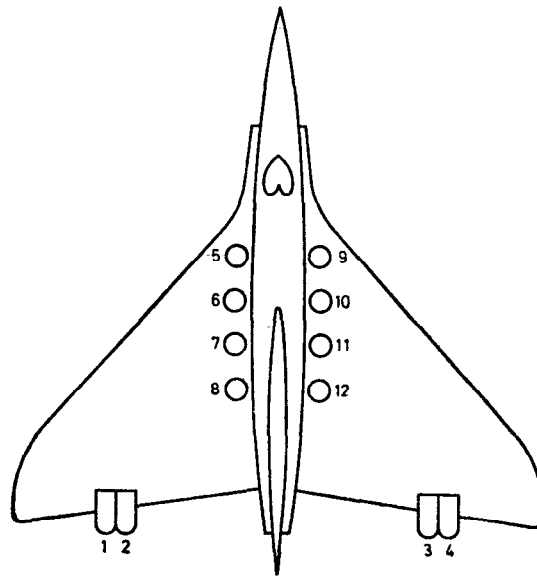


FIG. 2 NUMBERING OF VERTICAL THRUST ENGINES

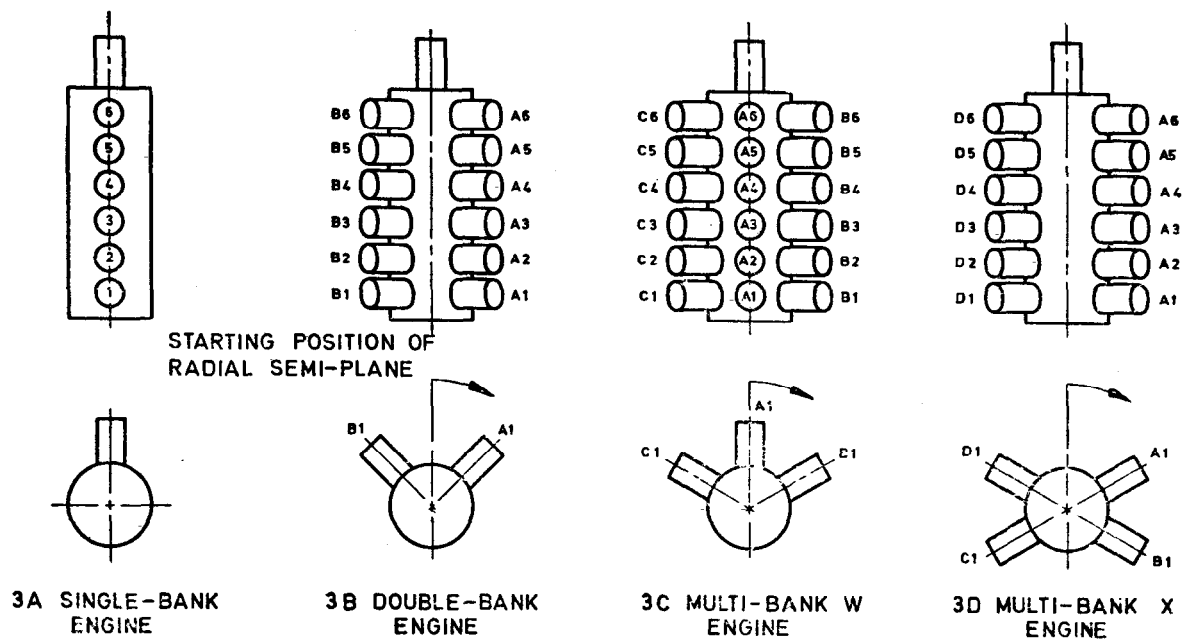


FIG. 3 NUMBERING OF CYLINDERS OF IN-LINE PISTON ENGINES

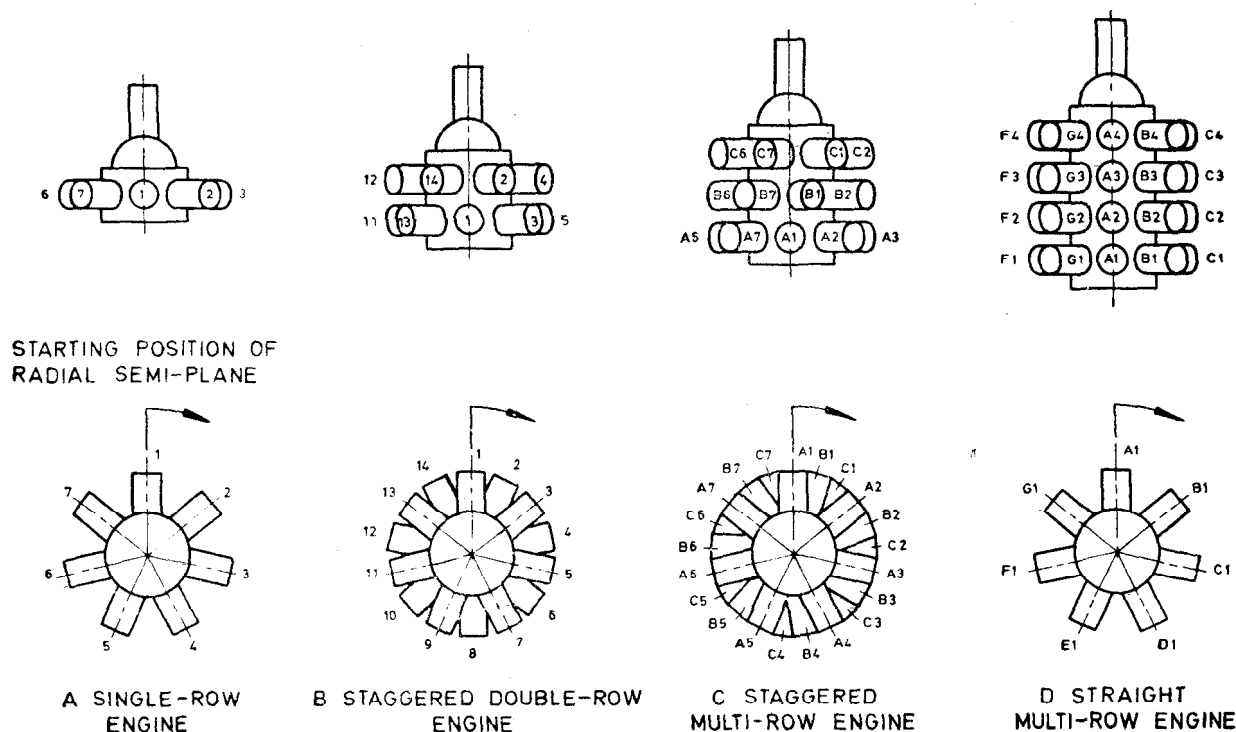


FIG. 4 NUMBERING OF CYLINDERS OF RADIAL PISTON ENGINES

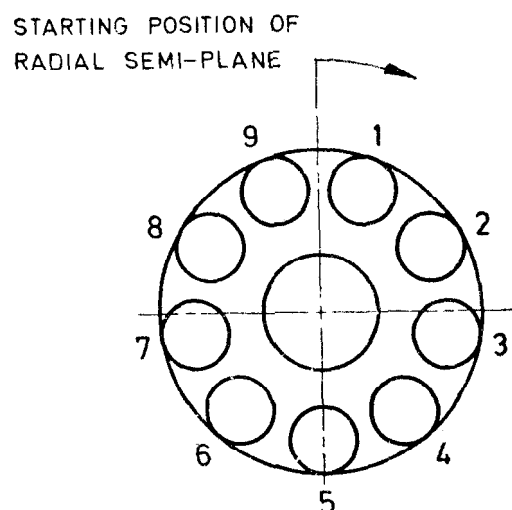


FIG. 5 NUMBERING OF TURBINE ENGINE COMBUSTION CHAMBERS

EXPLANATORY NOTE

The purpose of this standard is to specify a system of numbering of aircraft engines and its components on drawings, etc, and also describing the direction of rotation of engines and propellers.

While preparing this standard, assistance has been derived from BS M.41-1972 'Methods of numbering of aircraft engines, engine cylinders, combustion chambers and direction of rotation of engines and propellers' as well as ISO Recommendation R 482: 1966 'Numbering of aircraft engines, engine cylinders and combustion chambers, and direction of rotation of engines and propellers'.